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ABSTRACTS

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NEW TECHNIQUES: Imaging

O001: Simultaneous, multi-channel, near-infrared fluorescence visualization of mesenteric lymph nodes using indocyanine green and methylene blue: in a porcine model

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Introduction: Near-infrared fluorescence (NIRF) image-guided surgery is a useful tool that can help reduce perioperative complications and improve tissue recognition. Although indocyanine green (ICG) dye is the most frequently used in clinical studies, there is increasing evidence that methylene blue (MB), another clinically available fluorescent dye, can also be useful in the fluorescence-guided identification of ureters, thyroid and parathyroid glands, pancreatic neuroendocrine tumors and sentinel lymph nodes in breast cancer, among others. The aim of this study was to evaluate the feasibility of intraoperative lymph node fluorescence detection using intravenously (IV) administered MB and compare it to ICG.

Methods: Three pigs were used in this study. ICG (0.2 mg/kg) was administered via a peripheral venous catheter followed by immediate administration of MB (0.25 mg/kg). NIRF images were acquired as video recordings at different time points (every 10 min) over an hour using the QUEST SPECTRUMz® 3 (Quest Medical Imaging, Middenmeer, The Netherlands), which has two dedicated NIR channels for simultaneous intraoperative fluorescence guidance. The 800 nm channel was used to capture ICG fluorescence and the 700 nm channel was used for MB. The target (lymph nodes and small bowel) and the background (vessels-free field of the mesentery) was highlighted as the region of interest (ROI), and corresponding fluorescence intensities (FI) from these ROIs were measured. Fluorescence intensity was performed using the Quest Artemis (Quest Medical Imaging, Middenmeer, The Netherlands) software (TBR tool v1.0.). The target-to-background ratio (TBR) was then computed as the mean FI of the target minus the mean FI of the background divided by the mean FI of the background.

Results: In all included animals, a clear identification of lymph nodes was achieved at all time points. The mean TBR of ICG in lymph nodes and small bowel was 4.57 ± 1.00 and 4.37 ± 1.70, respectively for the overall experimental time. Regarding MB, the mean TBR in lymph nodes and small bowel was 4.60 ± 0.92 and 3.27 ± 0.62, respectively. The Mann–Whitney *U* test of the lymph node TBR/small bowel TBR showed that the TBR ratio of MB was statistically significantly higher than ICG.

Conclusion: The fluorescence optical imaging technology used allows for multi-wavelength assessment. This feasibility study proves that lymph nodes can be discriminated using two different fluorophores (MB and ICG) with different wavelengths. MB performance may represent a more accurate way of detecting lymphatic tissue during image-guided surgery. Further confirmatory preclinical trials are necessary before clinical translation.

HEPATO-BILIARY & PANCREAS: Liver

P146: Impact of sarcopenia as a prognostic factor on laparoscopic or open hepatectomy for hepatocellular carcinoma

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Aims: Recently, sarcopenia has been reported to be an independent risk factor in prognosis for patients with hepatocellular carcinoma (HCC). This study aimed to investigate the impact of preoperative sarcopenia on the outcomes of patients with HCC who underwent either laparoscopic or open hepatectomy as initial treatment.
Methods: A retrospective analysis of 336 patients with HCC who underwent hepatectomy from January 2011 to December 2019 was performed. Patients underwent either laparoscopic hepatectomy ($n = 123$) or open hepatectomy ($n = 213$) as initial treatments. Patients were classified into two groups according to the presence or absence of sarcopenia: the sarcopenia and the non-sarcopenia groups. Overall survival (OS) after either laparoscopic or open hepatectomy was compared and prognostic factors were evaluated using Cox proportional hazards regression models.
Results: In the laparoscopic hepatectomy, 44 patients (36%) were classified into the sarcopenia group and 79 (64%) into the non-sarcopenia group. The 1, 3, and 5-years OS rates for patients with sarcopenia and non-sarcopenia were 95%, 81%, and 57% vs. 99%, 88%, and 73%, respectively; they did not significantly differ ($p = 0.197$). On univariate and multivariate analysis, sarcopenia was not an independent risk factor of OS. On the other hand, 93 patients (44%) were classified into the sarcopenia group and 120 (56%) into the non-sarcopenia group in the open hepatectomy. The 1, 3, and 5-years OS rates for patients with sarcopenia and non-sarcopenia were 84%, 65%, and 54% vs. 95%, 83%, and 72%, respectively; they did significantly differ ($p = 0.005$). On univariate and multivariate analysis, sarcopenia was an independent risk factor of OS.
Conclusion: Sarcopenia was not an independent prognostic factor for initial laparoscopic hepatectomy in HCC. In contrast, Sarcopenia was an independent prognostic factor for initial open hepatectomy in HCC.

HEPATO-BILIARY & PANCREAS: Liver

P148: Features of the liver functional state indicators dynamics in patients with portal hypertension in wartime conditions

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The aim of the study was to evaluate features of the liver functional state indicators dynamics in patients with portal hypertension in wartime conditions during war in Ukraine.
Methods: The study included 22 patients with a confirmed diagnosis of liver cirrhosis complicated by PH and esophageal variceal bleeding. Two groups were formed: Group 1—patients treated more than 6 months before the war; Group 2—patients treated less than 1 month before war. All patients were prescribed drug therapy and endoscopic band ligation was performed. There were four visits with an interval of 1 month. At each time point liver functional state indicators (total bilirubin, direct bilirubin, alanine aminotransferase, aspartate aminotransferase, γ-glutamyltranspeptidase, alkaline phosphatase, albumin, urea, prothrombin time, international normalized ratio) were evaluated.
Results: Patients of both groups showed a significant ($p < 0.05$) improvement in studied indicators during the first month. In Group 1 during the next visits, no changes were observed in the studied parameters. Wartime conditions and the associated stay of patients in a state of permanent stress led to a progressive deterioration in the condition of patients in Group 2 starting from the second visit. At the fourth visit the values of liver functional state indicators were slightly and not significant ($p > 0.05$) better than the initial data.
Conclusion: In wartime conditions the cumulative effect of permanent stress in patients with liver cirrhosis complicated by portal hypertension lead to a progressive violation of liver function which is manifested by the deterioration of laboratory markers of the functional state of the liver.